
3.0 General Comments and Responses



1. NMFS does not have authority to issue ITPs for salmon without a 4(d) rule.

While it is true that the permitting authority for NMFS (50 CFR 222.307) states that, for a threatened species, section 9 “take” prohibitions must first be in place before a permit is issued, a permit can be issued that becomes effective on the date that “take” prohibitions become effective. In the case of this permit application, one species, Puget Sound chinook, is listed as threatened. A final ESA 4(d) rule was issued by NMFS on 10 July 2000 covering this species (65 FR 42422), and is scheduled to become effective in December 2000.

2. The 50-year term of the Incidental Take Permit is too long.

Both USFWS and NMFS regulations for ITPs outline factors to consider when determining permit duration (50 CFR 17.32 and 222.22). These factors include duration of the applicant’s proposed activities and the expected positive and negative effects on covered species associated with the proposed permit duration. In determining the duration on an ITP, the Services also consider the extent of scientific and commercial data underlying the proposed HCP, the length of time necessary to implement and achieve benefits of the HCP, and the extent to which the HCP incorporates adaptive management strategies.

To date the Services have issued more than 300 ITPs varying in duration from 1 to 100 years. The average duration of ITPs is 25 years with the trend moving toward longer permit durations. The Services allow a range in ITP duration to account for both the varying biological impacts resulting from the proposed activity and the nature or scope of the permitted activity. Large-scale HCPs, like the Tacoma Water HCP, are likely to have longer term ITPs because of the time required to implement the Habitat Conservation Measures and the applicant’s need for long-term assurances. Long-term permits also ensure long-term commitments to species conservation on the part of the permittee.

1 **3. Tacoma's commitment to habitat preservation and protection in the Green River**
2 **Watershed must meet or exceed the City of Seattle's level of commitment to habitat**
3 **protection in the Cedar River Watershed.**
4

5 Any applicant's commitment under an HCP, whether a public utility or private entity, must meet the
6 issuance criteria of an ITP listed under Section 10(a)(2)(B) of the Endangered Species Act of 1973,
7 as amended. These criteria are: 1) the taking must be incidental; 2) the applicant will, to the
8 maximum extent practicable, minimize and mitigate the impacts of such taking; 3) the applicant will
9 ensure adequate funding for the plan will be provided; 4) the taking will not appreciably reduce the
10 likelihood of the survival and recovery of the species in the wild; and 5) the applicant will meet
11 other measures that the Secretary may require as being necessary or appropriate for the purposes of
12 the plan. The Services' decision whether or not to issue an ITP for any particular HCP is based on
13 the proposed HCP meeting the above issuance criteria. Tacoma, like the City of Seattle and other
14 HCP applicants, are subject to, and will be required to meet the same standards for an ITP.
15

16 To determine whether the issuance criteria can be achieved, each HCP must be evaluated on its own
17 merit taking into consideration site-specific conditions, the nature and extent of covered activities,
18 species addressed by the plan, and the proposed Habitat Conservation Measures developed to
19 minimize and mitigate impacts to the maximum extent practicable.
20

21 **4. Water conservation measures and water reuse should be implemented for habitat**
22 **preservation and restoration; instead of allowing Tacoma Water to withdraw more**
23 **water from the Green River, Tacoma must be held to a higher standard of water**
24 **conservation and reuse than is currently implemented.**
25

26 Tacoma Water exceeds all state requirements for water conservation and implements water
27 conservation measures to forestall the need to develop new water supplies. Since 1987, Tacoma
28 Water's conservation program has saved an estimated 17,860,000 gallons per day through the efforts
29 of its ongoing supply and demand side water conservation initiatives.
30

31 Supply side water conservation measures are those that focus on improving water transmission and
32 distribution systems. Tacoma Water has an active program of supply side water conservation
33 measures that includes supply line leak detection and repair, transmission line leak detection and
34 repair, hydrant upgrade and repair, large commercial meter testing, reservoir rehabilitation and
35 replacement, and water distribution line replacement. Water savings from Tacoma's supply side
36 conservation program have averaged about 5,820,000 gallons per day since 1987.

Section 3.0 General Comments and Responses

1 Demand side water conservation measures are those that focus on reducing customers' use of water.
2 They include indoor and outdoor water use audits; marketing of low-flow water fixtures (such as
3 showerheads and faucets), toilet and faucet retrofit devices, and irrigation system devices; rebates
4 and grants; and education and public awareness initiatives. Water savings from Tacoma's demand
5 side conservation program have averaged about 12,040,000 gallons per day since 1987.

6
7 Tacoma Water's conservation program has focused on systematically reducing water usage where
8 there is the greatest opportunity to achieve documented water savings. Analysis of potential savings
9 in Tacoma Water's service area indicates that the greatest conservation potential is among Tacoma
10 Water's commercial, industrial, and institutional customers. Actual savings depend not only on
11 water conservation programs, but also on factors such as water and sewer rates and the health of the
12 local economy.

13
14 For over a decade, Tacoma Water has been working with the largest customers in its commercial,
15 industrial, and institutional customer class to investigate ways to save water. The largest individual
16 water user in Tacoma Water's service area, and one of the first to collaborate with Tacoma Water
17 on reducing its water consumption, is the Simpson Tacoma Kraft mill. Between 1990 and 1999, the
18 Simpson mill was able to cut its water consumption by 30 percent, from 30 million gallons per day
19 (mgd) to 21 mgd. Since then, many of Tacoma Water's larger customers have implemented water-
20 and energy-saving strategies. In the mid-1990s, prompted by the prospect of increasing sewer rates,
21 Atlas Foundry, Pabco Roofing, and PW Pipe began recirculating cooling water instead of
22 discharging it after one use. PW Pipe was able to reduce its water use by 97 percent. Atlas reduced
23 its use 76 percent, and Pabco by 75 percent.

24
25 In 1999, Tacoma Water launched a conservation audit program for some of its largest industrial
26 customers. The audits examined water use for Pioneer Chlor-Alkali, US Oil, G-P Gypsum,
27 Continental Lime, and the Tacoma Public Works Department's Incinerator. Tacoma Water will use
28 the information it obtains from the audits to provide these businesses with prioritized, financially
29 attractive options for saving water.

30
31 Significant water savings have also been realized during the past decade through programs targeting
32 residential water users. In 1993, 26,000 Tacoma Water customers had low-flow shower heads and
33 faucet aerators installed in their homes and received toilet retrofit kits. Six months after this program
34 ended, an estimated 90 percent of the participating customers retained and used these new products.
35 In 1997, Tacoma Water collaborated with other northwest utilities in a program to provide rebates

Section 3.0 General Comments and Responses

1 to customers who purchased water- and energy-efficient washing machines. About 400 Tacoma
2 Water customers took advantage of the program. Since 1994, Tacoma Water has offered water
3 conservation seminars to help homeowners and landscape professionals learn about water-saving
4 techniques for their homes and landscapes.

5
6 In 1992, Tacoma Water revised its rate structure for residential and wholesale customers to include
7 a 25 percent higher rate for water use in the summer. At the same time, Tacoma Water eliminated
8 its “declining block rate” for commercial, industrial, parks, and irrigation customers. Tacoma Water
9 also amended its contract with Simpson Tacoma Kraft Company to encourage the company to
10 reduce its water use without financial penalties.

11
12 In the past 20 years, the average daily water consumption rate among Tacoma Water households has
13 declined even as the number of customers has increased. Although it is not possible to accurately
14 estimate future water savings through conservation, Tacoma Water continues to help its customers
15 identify and implement strategies that result in documented, measured savings. Future programs
16 could include rebates for installing water-efficient plumbing fixtures and irrigation systems,
17 education, demonstration gardens, and water use audits.

18
19 Despite the extensive effort Tacoma Water has made towards conserving water, the demand for
20 water in Pierce and King Counties continues to increase with population growth. The State Growth
21 Management Act, enacted in 1990, requires that these two counties plan for growth (RCW 36.70).
22 Tacoma, Seattle, and a number of other cities in King County developed growth management plans
23 as well to forecast and direct growth within their planning areas. Tacoma Water’s municipal water
24 development initiatives are made in response to the growth-related service requirements identified
25 by Growth Management Act planning (see also General Comment Response 28). Because of the
26 increasing demand for water supplies, Tacoma will need to make use of its water rights on the Green
27 River of up to 213 cfs.

28
29 Water reuse is an alternative that is increasingly being evaluated to replace or augment water
30 supplies in specific applications. With three wastewater treatment plants located in the Tacoma
31 Water service area, water reuse has been seriously evaluated as a water supply alternative. In 1994,
32 Tacoma Water contracted with CH2M Hill to conduct a water reuse feasibility study. The study
33 considered two categories of uses for reclaimed water: landscape irrigation and industrial processes.
34 Potential irrigation sites, such as parks, schools, and golf courses were identified in the vicinity of
35 each wastewater treatment plant. Ten industries were also identified as potential candidates for

Section 3.0 General Comments and Responses

1 reclaimed water use. The reuse feasibility study concluded that alternatives using reclaimed water
2 for industrial processes appeared to be more attractive than those alternatives using reclaimed water
3 for landscape irrigation, primarily because of the cost of facilities attributed to distribution and part-
4 time water usage. Further study was recommended to further define the feasibility of industrial reuse
5 in the Tacoma area.

6
7 In 1997, two industrial conservation and water reuse assessments further studied the potential for
8 reducing water consumption at two identified pulp and paper mills within or adjacent to the Tacoma
9 Water service area. After conducting a water balance and evaluating water quality requirements,
10 conservation measures and water reuse opportunities were identified. The results of the study
11 indicated that an estimated 1.4 mgd of water savings were available through conservation and
12 5.2 mgd through water recovery and reuse at the Stone Consolidated West Tacoma mill (now the
13 Abitibi mill) near Pierce County's Wastewater Treatment Plant. At the Simpson Tacoma Kraft mill
14 near the City of Tacoma's Wastewater Treatment facility, up to 8 mgd of water conservation savings
15 were identified along with 12 mgd of water savings through water recovery and reuse. The next step
16 to be taken by Tacoma Water is to conduct a detailed engineering evaluation of the cost-effective
17 conservation and water recovery measures. This would better define and quantify the volume of
18 water savings, facilities, and costs necessary to achieve those water savings.

19
20 Tacoma Water recently added a new policy to its currently proposed Comprehensive Water System
21 Plan Update that is designed to encourage water reuse among large users of irrigation water. The
22 policy, entitled "Irrigation Supply for Large Users," requires that any new large user of irrigation
23 water, such as a cemetery, park, or golf course, provide Tacoma Water with an assessment of other
24 available water sources and estimates of the cost of source development. In the event that Tacoma
25 Water does provide service to the new large user, the service will be considered an interruptible
26 water supply.

27
28 The implementation of this policy will most directly involve Planned Residential Developments, or
29 PRDs, that have golf courses proposed with residential developments. In the case of one newly
30 developed PRD, Cascadia, Tacoma Water has agreed to supply an interim irrigation source for the
31 Cascadia golf course until the Town of Orting's sewer plan amendment can be completed. This
32 cooperative agreement calls for a treated effluent line from the Sewage Treatment Plant to provide
33 irrigation water to the golf course.

1 **5. Water users should be required to pay the full costs of habitat preservation and**
2 **protection measures through rate increases as opposed to relying on revenue from**
3 **timber harvest in the upper watershed.**
4

5 Tacoma's Forest Lands Management Plan, which is part of the HCP, designates its 14,888 acres into
6 Natural, Conservation, and Commercial Forest Management Zones. Timber harvest may occur in
7 both the Conservation and Commercial Zones for a maximum harvest of 80 acres per year. The
8 opportunity to harvest timber would provide Tacoma Water with revenue to provide for watershed
9 improvements, including fish and wildlife habitat modification and protection measures, land
10 purchases, and sustainable forest management.

11
12 Tacoma's Forest Management component in the HCP exceeds all state requirements for habitat
13 protection. Tacoma would comply with any future changes to federal and state requirements
14 through adaptive management.

15
16 Evaluation of the environmental effects of the proposed timber harvest included in this HCP has
17 resulted in the determination that it can be conducted within the constraints of the ESA (General
18 Comment Response 7). Tacoma Water has a responsibility to its ratepayers to provide water at the
19 lowest rates possible commensurate with its cost of operations including environmental
20 responsibilities. Tacoma's ratepayers would bear a substantial portion of the cost to implement HCP
21 conservation measures with or without timber harvesting. However, timber harvest revenue would
22 reduce the increased cost to Tacoma Water's ratepayers to implement the HCP.

23
24 **6. Describe how Tacoma Water will coordinate with other landowners and managers in**
25 **the upper watershed to restore and protect fish and wildlife habitat.**
26

27 Tacoma has cooperative agreements with all the major public and private landowners in the Upper
28 Green River Watershed that benefit fish and wildlife habitat. The following summarizes these
29 coordination activities and habitat benefits.

30
31 Some landowner agreements date back to 1914 and have been updated to reflect changes in water
32 quality regulations, forest practices rules, land ownership, and transportation needs. The main focus
33 of these agreements is to control human activities (trespass, fire, and forest practices) within the
34 watershed that may degrade water quality. These agreements are administered by Tacoma's Water
35 Quality Section and implemented by watershed inspectors who are in the watershed 7 days a week.

Section 3.0 General Comments and Responses

1 These agreements would be kept in force through the 50-year term of the HCP. In conjunction with
2 these agreements, Tacoma meets regularly with watershed landowners to discuss various planned
3 forest management activities and concerns regarding any impact to water quality.

4
5 In developing this HCP, Tacoma Water and the Services took into account existing HCPs and forest
6 management plans on adjacent lands to coordinate the assignment of the forest management zone
7 in Tacoma's HCP to best fit the goals of the adjacent landowner and Tacoma Water. This resulted
8 in designating approximately 1,500 acres in the Natural Zone adjacent to the U.S. Forest Services'
9 Snoqualmie Pass Adaptive Management Area and the Kelly Butte Roadless Area. This will provide
10 mature habitat for a north and south dispersal corridor for listed species. Tacoma's HCP contributes
11 to adjacent landowner's habitat conservation through its conservation measures and strategic land
12 ownership. One such conservation measure, HCM 3-03J Culvert Improvements, would allow fish
13 passage up and down streams providing access to stream habitat on adjacent landowner properties.

14
15 Tacoma would continue to participate in state Watershed Analyses under HCM 3-03A. This process
16 gives Tacoma another opportunity to coordinate forest management practices among adjacent
17 landowners in the watershed. In the past Tacoma Water has participated on the assessment and
18 prescription team on five of the total of six Watershed Administrative Units (WAU) in the upper
19 Green River Watershed. The last Watershed Analysis has been started and should be completed in
20 2001. The 5-year review of the Lester Watershed Analysis is due in 2003, and Tacoma will
21 participate in this review as well.

22
23 Tacoma Water also receives copies of all state Forest Practices Applications (FPA) submitted by
24 watershed landowners for review and comment. If Tacoma sees a potential water quality problem
25 caused by an FPA, the landowner is contacted and asked to modify its application, or the DNR is
26 asked to condition the application.

27
28 Tacoma Water and the USACE are developing an operating plan to coordinate the activities of both
29 parties in the watershed. The primary purpose of this coordinating document is to assure that both
30 the USACE and Tacoma Water comply with the ESA. As responsible agencies under the ESA, the
31 USFWS and NMFS will facilitate this coordination. This agreement will outline responsibilities for
32 construction, operation, maintenance, and monitoring of the various conservation measures in the
33 HCP.

7. **Tacoma Water should not be allowed to harvest timber in the upper watershed.**

Several comments suggested that Tacoma Water should cease all commercial timber harvesting on City lands in the Upper Green River Watershed. Tacoma currently harvests timber from its lands to generate revenue and/or enhance fish and wildlife habitat. In keeping with the Forest Land Management Plan Tacoma prepared for the watershed in 1996, timber harvesting occurs at a very low rate and is subject to several self-imposed restrictions to protect water quality and habitat for fish and wildlife. As part of its current application to the Services for an ITP, Tacoma has requested coverage for its timber harvesting and other watershed management activities. During development of the HCP, the Services suggested and Tacoma accepted several additional restrictions on timber harvest activity to minimize and mitigate the impacts of any authorized incidental take in the upper watershed. These new restrictions, along with the original restrictions of the Forest Land Management Plan, are included in Tacoma's HCP. Prior to issuance of the ITP, the Services will review the HCP, assess the anticipated level of incidental take, and determine whether the HCP measures provide adequate mitigation to meet the criteria of ESA Section 10(a)(2)(B). Beyond requiring Tacoma Water to meet those ITP issuance criteria, the Services cannot impose additional restrictions on Tacoma's activities or disallow timber harvesting in the upper watershed.

Preliminary review of the Tacoma Water HCP by the Services suggests the proposed mitigation in the upper watershed is adequate for at least three reasons:

- # the proposed level of timber harvesting will affect a small percentage of Tacoma's ownership on an annual basis, and an extremely small percentage of the Upper Green River Watershed overall;
- # the proposed timber harvesting is compatible with the protection of fish and wildlife habitat and the maintenance of surface water quality in the Upper Green River Watershed; and
- # the proposed level of mitigation would meet or exceed the level of mitigation and resource protection provided by other approved forestland HCPs in the region, and would be roughly comparable to the Northwest Forest Plan for the management of federal lands administered by the U. S. Forest Service and the U.S. Bureau of Land Management.

1 Each of these items are discussed in detail below.

2
3 **Proposed Level of Harvesting:** Tacoma owns 14,888 acres in the Upper Green River Watershed
4 and manages the land in three zones (Natural, Conservation, and Commercial). The City's
5 ownership represents approximately 10 percent of the total area of the watershed above the
6 headworks dam. Of the 14,888 acres, Tacoma Water would conduct even-aged harvesting
7 (clearcutting) on an average of no more than 1.5 percent of the conifer-dominated stands in the
8 Commercial Zone each year (approximately 27 acres under current conditions). Tacoma would also
9 conduct uneven-aged harvesting (commercial thinning) for wildlife habitat improvement on an
10 average of no more than 2 percent of the conifer-dominated stands in the Conservation Zone in any
11 year (approximately 24 acres under current conditions). This uneven-aged harvesting would only
12 occur in stands less than 100 years old, and would cease once all conifer-dominated stands in the
13 Conservation Zone reach 100 years of age. Lastly, hardwood conversion (clearcutting of alder
14 stands and replanting with young conifers) would occur on an unlimited number of acres in the
15 Commercial and Conservation Zones each year until all sites capable of supporting conifer-
16 dominated stands are converted. Tacoma Water estimates that hardwood conversion would occur
17 on approximately 29 acres each year. Uneven-aged harvesting and hardwood conversion are largely
18 measures to return Tacoma lands to the type of forest that dominated the watershed prior to early
19 timber harvesting, but they are included here because they involve the harvest of overstory
20 vegetation. The combined harvesting (even-aged, uneven-aged, and hardwood conversion) covered
21 by the ITP would involve no more than 80 acres per year. This 80 acres amounts to approximately
22 0.5 percent of Tacoma's ownership in the upper watershed, and 0.05 percent of all ownerships in
23 the upper watershed.

24
25 **Compatibility of Timber Harvesting:** The Upper Green River Watershed has been managed for
26 commercial timber production for several decades without impairing Tacoma's ability to withdraw
27 clean, safe water from the river. Recent changes in the management of other lands in the upper
28 watershed will only improve surface water quality, and further reduce the potential for conflicts
29 between timber harvesting and other resource uses such as fish and wildlife. Federal lands in the
30 upper watershed are now managed under the Northwest Forest Plan, state lands are managed under
31 the DNR HCP, Plum Creek Timber Company lands are managed under an HCP, and all other lands
32 will be managed according to the Forests and Fish Report as it is implemented through Washington
33 Forest Practices Rules. Given this increased level of attention to fish, wildlife, and surface water
34 quality throughout the upper watershed, the proposed harvesting of commercial timber from Tacoma
35 lands is expected to have overall negligible adverse effects.

1 **Proposed Mitigation:** Impacts to listed species from timber harvesting on Tacoma Water lands are
2 expected to be minor because of the limited number and location of acres affected in any year. To
3 mitigate for the impacts, Tacoma Water would:

4
5 # dedicate 5,850 acres (including 4,619 acres of forest land) as no-harvest Natural
6 Zone for the full term of the HCP;

7
8 # dedicate 5,180 acres (including 3,193 acres of forest land) as Conservation Zone
9 where commercial timber harvesting would occur only to accelerate the development
10 of late-seral coniferous forest conditions in stands less than 100 years old;

11
12 # manage the remaining 3,858 acres as commercial forest land on a 70-year harvest
13 rotation (approximately 20 years longer than the industry standard in western
14 Washington);

15
16 # conduct salvage logging only in the Commercial Zone, in stands less than 100 years
17 old in the Conservation Zone, and along roads in the Natural Zone where human
18 safety is a concern;

19
20 # retain snags, green recruitment trees, and logs at the time of commercial harvesting
21 at double the rate required under current Forest Practices Rules;

22
23 # limit the size of even-aged harvest units to 40 acres and uneven-aged harvest units
24 to 120 acres;

25
26 # conduct no timber harvesting on sites incapable of sustaining commercial timber
27 production under a 70-year rotation (i.e., sites of low productivity where the
28 Douglas-fir 50-year Site Index is less than 80);

29
30 # limit the amount of post-harvest slash burning;

31
32 # implement riparian and wetland buffers that exceed the requirements of the Forests
33 and Fish Report; and
34
35

implement several site-specific measures to protect listed wildlife species during timber harvesting, road construction, and other management activities.

8. Tacoma Water should purchase more land in the upper watershed for the preservation and protection of fish and wildlife habitat.

Tacoma Water actively evaluates all opportunities to purchase land in the upper watershed with the primary goal of protecting water quality. This leads to acquisition of lands in the riparian corridor around the mainstem of the Green River and its major tributaries and sensitive areas close to the river that could adversely affect water quality. This effort to protect water quality also results in the preservation and protection of fish and wildlife habitat.

Tacoma Water continuously carries out a program of evaluating land that becomes available in the watershed for purchase. Land often becomes available with little or no notice, and the opportunity to acquire additional land may pass if not acted upon swiftly. Tacoma intends to continue its policy of acquiring land in proximity to the Green River and its tributaries as it becomes available to protect water quality. The amount of land purchased is limited by revenue and the availability of willing sellers, but opportunities may be expanded by cost sharing with other parties interested in protecting land in the Green River Watershed.

9. Habitat Conservation Measure 3-01F, Salvage Harvesting, should be modified to prevent wide-scale forest harvest operations within the forest management zones.

Salvage harvesting of timber is addressed in HCM 3-01F. This measure already places several restrictions on salvage harvesting to ensure it will not lead to wide-scale timber harvesting. On the contrary, salvage harvesting would be used primarily to limit the effects of natural mortality and to maintain mature coniferous forest on the Covered Lands. Without salvage harvesting, it could become difficult for Tacoma Water to maintain mature coniferous forest and to meet habitat goals of the HCP.

As stated in HCM 3-01F, salvage harvesting may only occur subject to the following conditions:

There would be no salvage harvesting in the Natural Zone, in stands over 100 years old in the Conservation Zone, in riparian and wetland buffers in the Conservation and Commercial Zones, and on sites with a Douglas-fir site index of 80 or less. This

Section 3.0 General Comments and Responses

represents at least 4,619 acres (approximately 40% of the Tacoma Water ownership in the upper watershed) where there would be no salvage harvesting allowed.

Salvage harvesting may occur in stands less than 100 years old in the Conservation Zone only when insects, fire, windthrow, or disease reduces the total canopy closure to less than 40 percent over 2 or more acres.

Salvage harvesting may occur in the Commercial Zone only when insects, fire, windthrow, disease, or flood reduces total canopy closure to less than 40 percent over 2 or more acres;

Salvage harvesting may occur on a selective basis within 150 feet of roads in all zones where individual trees present a safety hazard to humans.

Individual salvage harvest areas would not exceed 120 contiguous acres (Note: this measure has been revised in response to public comment to eliminate the option for conducting larger salvage harvests).

All snag, green recruitment tree, and log requirements of HCM 3-01G would apply to salvage harvesting.

When conducting salvage harvesting, Tacoma Water would remove only dead, dying, and damaged trees from areas of extensive mortality, unless the removal of live trees is necessary to obtain access to dead and damaged material. This is done to limit the further spread of disease and insects, to expedite reforestation of affected areas, and to capture the economic value of the trees before they rot (Note: this measure has been revised in response to public comment).

The general environmental concerns about salvage harvesting are that it can cause site disturbance, and it can result in the complete removal of dead and dying trees that are important elements of fish and wildlife habitat. Both of these concerns are addressed in the Tacoma Water HCP. Site disturbance and the removal of important habitat elements would be limited by excluding salvage harvesting from the Natural Zone and in stands more than 100 years old in the Conservation Zone (except along roads), as well as from no-harvest buffers on streams and wetlands. Site disturbance would be limited because salvage harvesting must be consistent with all HCP measures that restrict activity on steep and unstable slopes and in other areas sensitive to the use of heavy equipment.

1 Where salvage harvesting does occur, sufficient numbers of snags, green retention trees, and logs
2 would be retained because of the requirements of HCM 3-01G.

3
4 Salvage harvesting is a particularly important part of the Tacoma Water HCP because of the small
5 size of the Tacoma Water ownership. It is a goal of the HCP to provide late-seral coniferous forest
6 habitat for fish and wildlife. Natural mortality from insects, disease, wind, or fire could impact a
7 significant portion of the Covered Lands if allowed to spread unchecked, and reduce the ability of
8 Tacoma Water to meet its habitat goal. While catastrophic tree mortality is a natural component of
9 the forest landscape, the effects of such mortality are far greater now than they were when late-seral
10 forest existed across the Pacific Northwest. The loss of several hundred acres of mature forest to
11 natural mortality was insignificant when the region supported several million acres of similar
12 habitat. The effects of such a loss today are quite different, however, because the total area available
13 for management is only a few thousand acres. Tacoma Water's intent under the HCP is to retain the
14 beneficial aspects of tree mortality (e.g., dead and dying trees and logs) while preventing the
15 mortality from eliminating late-seral forest habitat altogether.

16
17 Lastly, the protection of the vegetative cover within the watershed is important for protecting water
18 quality. Allowing large areas of the watershed to be impacted by fire, insects, or disease would be
19 counter to Tacoma Water's efforts to maintain water quality.

20
21 **10. Existing roads on Tacoma lands in the upper watershed should be abandoned, and no**
22 **new roads should be constructed.**
23

24 Tacoma Water maintains roads in the Upper Green River Watershed to meet a number of
25 management-related needs. Roads are maintained to facilitate essential watershed management
26 activities (e. g., water quality sampling, safety and security patrol, and fire suppression), to conduct
27 forestry operations (including commercial logging), and to comply with joint access agreements
28 with other landowners in the watershed. Watershed management and compliance with joint access
29 agreements are mandatory activities, which Tacoma Water cannot unilaterally discontinue. These
30 needs would continue under the HCP, so abandonment of roads is not always practicable.
31 Commercial logging on Tacoma Water lands is an optional activity, but as explained in the response
32 to General Comment 7, it is an activity that would be done in a manner consistent with the Services'
33 conservation goals for listed species in the upper watershed.

Given the need to maintain roads in the upper watershed, Tacoma Water is committed to minimizing the environmental impacts of those roads. Several Habitat Conservation Measures (HCM 3-03B through 3-03J) are designed specifically for this mitigation purpose. New roads would be constructed to state standards for excavation, surfacing, and drainage in effect at the time of construction to minimize mass wasting, surface erosion, and interruption of fish movements. Existing roads would be upgraded, as needed, to meet those same standards. Roads that are no longer needed would be abandoned, again in compliance with current standards to control mass wasting and erosion.

To minimize the impacts of road use, Tacoma Water would discontinue heavy truck traffic under its control (e.g., log hauling) when there is a potential for an impact on water quality that could adversely affect fish habitat (HCM 3-03G). Tacoma Water would also modify or halt road construction under its control when needed to avoid disturbing covered wildlife species during nesting, denning, and/or foraging (HCM 3-04A, 3-04B, 3-04C, 3-04D, 3-04G, 3-04H, 3-04I, 3-04J, 3-04K, 3-04M, 3-04O, 3-04Q and 3-04U). The Services expect that management of roads under these provisions of the HCP will ensure that impacts to listed fish and wildlife species will be minimized.

11. Riparian management measures proposed in Tacoma's forest management zones will not provide functional riparian habitat.

Riparian habitat is considered to be properly functioning if "the riparian reserve system provides adequate shade, large woody debris recruitment, and habitat protection and connectivity in all subwatersheds, and buffers or includes known refugia for sensitive aquatic species" (National Marine Fisheries Service 1999). Strategies for achieving properly functioning riparian ecosystems are identified in the NMFS recent proposed chinook salmon 4(d) rule for seven ESUs in Washington and Oregon (50 CFR 223). The 4(d) rule identifies the Forests and Fish Report as an appropriate strategy for maintaining and achieving proper riparian function in managed forest lands.

The riparian protection strategy proposed by Tacoma would best be considered a natural succession and growth strategy as described in 50 CFR 223. The Tacoma HCP establishes riparian management zones that are at least 200 feet wide along both sides of all fish-bearing streams. No timber harvest would occur within at least the first 150 feet of the management zones along fish-bearing streams. Disturbances by road crossings or cable yarding corridors would be limited to a small proportion of the riparian area. In addition, 50- to 25-foot-wide no-cut buffers would be left

1 adjacent to all perennial and seasonal non-fish bearing streams. The no-cut buffers on perennial
2 streams would be increased to 100 feet around sensitive sites known to provide refugia for
3 amphibian species.

4
5 A recent review of over 28 separate studies suggests that buffer widths of 150 feet equal or exceed
6 the width necessary to maintain riparian habitat functions including water temperatures, LWD
7 recruitment, nutrient input, sediment and pollutant filtration, and erosion control (Knutson and Naef
8 1997).

9
10 **12. Tacoma Water should not be allowed to store additional water behind Howard Hanson**
11 **Dam because of the impacts associated with inundation of reservoir riparian habitats.**
12

13 Tacoma Water acknowledges that storage of water behind Howard Hanson Dam for municipal use
14 will have environmental impacts on the reservoir shoreline. Howard Hanson Dam is a federal
15 facility operated by the USACE. The dam is currently operated for flood control, with secondary
16 fisheries benefits. The USACE is proposing to store additional water behind the dam in the future
17 under the Additional Water Storage Project, which is described on page 2-11 of the HCP. The
18 majority of water stored under the Additional Water Storage Project would come from Tacoma's
19 Second Diversion Water Right of 100 cubic feet per second (cfs). Most of the water would be
20 released from behind Howard Hanson Dam and subsequently withdrawn downstream at Tacoma's
21 Headworks to meet water supply needs in late summer and fall. Portions of the stored water would
22 also be released to increase instream flows in the lower river to benefit fish and other aquatic
23 resources.

24
25 Phase 1 of the Additional Water Storage Project would result in a pool raise from the existing high
26 pool elevation of 1,147 feet to a high summer pool under Phase 1 of the project of 1,167 feet. In
27 Phase 1, up to 280.5 acres of additional reservoir riparian area would be inundated during the
28 summer. Tacoma Water would retain 229 acres of existing forest within the new inundation zone
29 under HCM 2-04. Phase 2 of the Additional Water Storage Project would result in a summer pool
30 raise to 1,177 feet, but Phase 2 of the Additional Water Storage Project is not addressed by the HCP.
31 The Additional Water Storage Project would not affect winter flood control operations, and past
32 winter flood control operations have inundated the reservoir shoreline up to elevation 1,183 feet.
33 Impacts associated with reservoir inundation would be compensated by the mitigation and
34 monitoring measures proposed by the USACE as part of the Additional Water Storage Project. The
35 effects of the reservoir inundation and analyses of the required level of mitigation were addressed

1 in the Environmental Impact Statement for the Additional Water Storage Project and are not
2 included in the HCP analyses.

3
4 Since Tacoma Water is the local sponsor of the Additional Water Storage Project, and Tacoma
5 Water staff may implement some of the measures, mitigation and monitoring activities associated
6 with the Additional Water Storage Project were included as covered activities by Tacoma's ITP and
7 described in the HCP. Tacoma is requesting authorization for implementing mitigation and
8 monitoring measures, but authorization for project impacts to covered species associated with
9 reservoir inundation must be issued to the USACE through the processes described in Section 7 of
10 the ESA. That process is occurring concurrent with the review of Tacoma's request for an ITP under
11 Section 10 of the ESA. The relationship between Tacoma Water and the USACE is discussed in
12 subsection 2.7 of the HCP. The Services will review the Additional Water Storage Project under
13 Section 7 of the ESA, and will ensure that all appropriate steps are taken to avoid and/or mitigate
14 for any impacts to listed species. The Additional Water Storage Project will not proceed until the
15 USACE satisfies the requirements of the ESA through the Section 7 process.

16
17 **13. Tacoma Water should not be allowed to store additional water behind Howard Hanson**
18 **Dam because of the impacts to instream resources downstream of Howard Hanson**
19 **Dam.**

20
21 As previously noted in General Comment Response 12, Howard Hanson Dam is a federal facility
22 operated by the USACE. The storage of water behind Howard Hanson Dam under the Additional
23 Water Storage Project is a federal activity that cannot be covered by the Section 10 ITP being
24 requested by Tacoma. An ITP can only be issued to a non-federal entity. Instead, ESA coverage
25 for the Additional Water Storage Project is being pursued by the USACE through the ESA Section
26 7 process simultaneous with Tacoma's application for an ITP. Consequently, the Services are not
27 in a position to approve or deny the Additional Water Storage Project as part of Tacoma's request
28 for an ITP.

29
30 Tacoma is the local sponsor of the Additional Water Storage Project, and as such, is responsible for
31 paying a portion of the costs of the project. Tacoma acknowledges its responsibility to participate
32 in mitigating the adverse environmental effects of raising the level of the reservoir during the spring
33 and summer, but the act of storing water behind Howard Hanson Dam is a USACE action to be
34 addressed through the Section 7 ESA process. The effects of water storage behind Howard Hanson
35 Dam are not covered by Tacoma's ITP; but should Tacoma, as the local landowner, conduct

1 mitigation activities, the implementation of that mitigation would be covered under Tacoma's
2 Proposed ITP.

3
4 **14. The operation agreement between Tacoma Water and the U. S. Army Corps of**
5 **Engineers must be clearly described in the Habitat Conservation Plan.**
6

7 Tacoma Water and the USACE are in the process of developing an operating plan that will
8 coordinate the activities of the USACE at Howard Hanson Dam and Tacoma's operations as a water
9 utility. When completed this operating agreement will be subject to the requirements of the HCP
10 as well as requirements placed on the USACE through Section 7 of the ESA. It will not be a part
11 of the HCP due to the need to make adjustments and changes to the operating plan as new
12 information is obtained. The primary purpose of this coordination document is to assure that both
13 the USACE and Tacoma Water coordinated their ESA efforts. The USFWS and NMFS have
14 oversight of both the USACE and Tacoma Water under the ESA and will facilitate this coordination.
15

16 **15. Tacoma Waters' commitments to its partners in the Second Supply Project appear to**
17 **affect Tacoma's commitment to implement measures described in the Habitat**
18 **Conservation Plan; coordination agreements associated with the Second Supply Project**
19 **must be clearly identified in the Habitat Conservation Plan.**
20

21 All of Tacoma's commitments to its partners in the Second Supply Project are subject to
22 requirements of the HCP under Section 10 of the ESA. Tacoma's partners in the Second Supply
23 Project agree to take water from Tacoma's Second Diversion Water Right on an as-available basis.
24 This means that if instream flow thresholds identified in the HCP limit Tacoma's ability to divert
25 water under the Second Diversion Water Right, then neither Tacoma Water nor its partners would
26 be able to divert water during that time period. Water that has previously been diverted to storage
27 at Howard Hanson Dam during periods of higher river flow can be taken from storage and utilized
28 by Tacoma Water and its partners at any time.
29

30 Tacoma Water and the Services are currently unaware of any conflicts between the City's
31 commitment to its partners and its obligations under the proposed HCP. Tacoma's commitments
32 to its Second Supply Project partners were made with full knowledge and understanding of the
33 fisheries flow obligations in the HCP, specifically to avoid conflicts. If conflicts arise in the future,
34 Tacoma's obligations under the HCP would be modified only with the approval of the Services and
35 only through the ITP/HCP amendment processes of the ESA. Public notification and analyses of
36 environmental effects would be required for any major amendment to the HCP.

16. Describe how Tacoma Water will coordinate with other landowners and managers in the lower watershed to restore and protect fish and wildlife habitat.

The primary vehicle for the coordination of flow management in the lower Green River Watershed would be through the Green River Flow Management Committee, as noted in the HCP (page 5-39). As part of its ESA consultation requirements, the USACE has committed to convening the Committee and coordinating future flow management decisions. The Green River Flow Management Committee already meets on an ad hoc basis and consists of representatives of tribal, regulatory, resource management, and non-governmental agencies convened by the USACE to recommend adaptations in the water storage and the release regime of Howard Hanson Dam.

While the Committee is expected to make flow management recommendations to the USACE, it is ultimately the responsibility of the Services to ensure Tacoma's fish and wildlife conservation measures are in compliance with the ESA. Tacoma's annual reporting and 5-year summary reviews (HCP Chapter 6) would provide the Services with ample opportunity to ensure coordination of fish and wildlife measures with other landowners and managers in the lower Green River basin.

Tacoma Water is committed to water resource management planning efforts within the basin. In addition to commitments identified in the HCP, Tacoma is presently coordinating with basin-wide, natural resource management programs such as the Green/Duwamish Ecosystem Restoration Study and the Water Resource Inventory Area (WRIA) 9 planning effort. In WRIA 9, Tacoma participates on both policy and technical committees of the King County sponsored planning effort. This planning effort is evolving, and Tacoma Water expects it to become the focus for basin protection, restoration, and project coordination efforts. Although the current process has not been sanctioned by the Services as leading to satisfaction of ESA requirements, Tacoma expects that this process will evolve into, or be replaced by, a planning process that meets ESA requirements.

Tacoma also intends to cooperate with Ecology during Total Maximum Daily Load studies of the Green River. The Green River basin is the primary source of water for the City of Tacoma, and the City can be expected to take an active interest in reviewing future activities of other landowners and managers.

17. Instream flows should be increased to provide additional protection for fish.

The Services expect that the instream flow measures described in its HCP and guaranteed through the IA will contribute to the recovery of listed species and may help preclude the need to list other species addressed in the HCP. The instream flow measures proposed by Tacoma in its HCP were developed as a result of nearly 15 years of technical studies, analyses, negotiations, administrative hearings, and settlement agreements. The proposed conservation measures, as described in HCP Chapter 5, are designed to:

- # provide instream flows during the summer (that are higher than Ecology's instream flows) by restricting Tacoma's existing First Diversion Water Right claim and Second Diversion Water Right;
- # provide a minimum flow during extreme droughts that would require Tacoma to augment flows if inflow is less than 225 cfs (measured at Auburn);
- # cap Tacoma's First Diversion Water Right claim at 113 cfs;
- # limit pumping from well fields adjacent to the North Fork Green River to periods when turbidity in the mainstem Green River prevents direct water withdrawal at Tacoma's Headworks; and
- # establish a procedure for limiting pumping-related stage reductions in the North Fork Green River to no more than 1 inch per hour to partially protect adult salmon refugia.

These measures are designed to protect important fishery habitats in the Green River basin consistent with annual differences in precipitation and flow availability. Because of timing, the ecological benefits of such flows would include improvements in both habitat quantity and quality compared to baseline conditions. With respect to quantity, the flows would provide for a variety of important and seasonally specific life history stage requirements (see HCP, Appendix A), including adult salmon holding and spawning habitat, egg incubation, emergence of steelhead fry, and upstream passage of adult salmon (see HCP, Chapter 7). The flows for the period from 15 July to 15 September approximate those identified as providing peak adult chinook holding, and rearing habitat for juvenile chinook, coho, and steelhead in the section of river below the Tacoma Headworks (Caldwell and Hirschey 1989). The flows specified for Auburn (i.e., 400 cfs) for the

Section 3.0 General Comments and Responses

1 same time period (15 July to 15 September) would likewise partially protect adult chinook and
2 steelhead holding habitat and steelhead juvenile habitat. Anticipated benefits include improved, but
3 still only partially protected steelhead egg incubation and fry emergence, increased juvenile rearing
4 habitats, increased early summer holding habitats for adults and juvenile fish, and increased
5 attraction flows to facilitate adult returns to the river compared to baseline conditions.

6
7 The flows would also increase the amount of available freshwater habitat in the Green/Duwamish
8 estuary during the summer extreme low-flow periods. Benefits related to habitat quality during
9 extreme low flow periods would likely include reductions in water temperatures during the summer
10 months immediately below Howard Hanson Dam, increases in or maintenance of dissolved oxygen
11 (DO) levels, and the potential dilution of nutrients and introduced pollutants in the lower Green
12 River. Maintenance of minimum flows would provide a level of resource protection, but would not
13 provide the full range of flow variability needed to satisfy ecosystems functions. Flow variation,
14 to the extent allowed within the operation of Howard Hanson Dam for flood control, are provided
15 by other Habitat Conservation Measures.

16
17 The management of flows to minimize impacts to aquatic resources requires the participation of the
18 Green River Flow Management Committee. During the winter months, there is little opportunity
19 to modify flows for fish because the USACE operates Howard Hanson Dam for flood control.
20 Between late October and February, there is no water stored for flow augmentation; however, during
21 the period mid-February through mid-June, relaxation of flood control rules and conservation
22 measures within the HCP provide resource managers much greater opportunity to manage flows
23 than is presently available. During this period, members of the Green River Flow Management
24 Committee would have increased responsibility for adaptively managing flows in the Green River.
25 The storage of water for flow augmentation purposes also allows resource managers the opportunity
26 to modify flows through the summer and early fall. As part of the HCP, Tacoma Water has
27 committed to funding an extensive research and monitoring program to provide resource managers
28 the feedback necessary to adjust flows to benefit instream resources.

18. The Woody Debris Management Program should be modified to restore the volume of woody debris that occurred naturally in the watershed.

The Woody Debris Management Program described in the HCP is designed to partially restore the ecosystem functions of wood transport affected by non-Tacoma activities. On Tacoma lands, Tacoma has established a Natural Zone. The Natural Zone covers Tacoma-owned lands adjacent to the Green River, Howard Hanson Reservoir, and major tributaries. Tacoma would conduct no timber harvesting in the Natural Zone except to modify fish and wildlife habitat or to remove danger trees within 150 feet of roads (see HCM 3-01B). In addition to harvest restrictions in the Natural Zone, Tacoma would retain no-harvest riparian buffers along all streams on Tacoma lands in the Upper HCP area (see HCM 3-02A). As part of the Additional Water Storage Project, Tacoma Water would also contribute funds for a series of habitat rehabilitation projects above Howard Hanson Dam, including large woody debris placement (see HCM 2-03). These measures are designed to enhance wood recruitment and to mitigate for direct and indirect effects of water supply operations in the Upper Green River Watershed.

In addition to proposing measures to address the effects of water supply activities in the upper watershed, Tacoma Water has proposed to contribute to partially restoring woody debris functions in the middle and lower Green River affected by non-Tacoma activities. The operation of Howard Hanson Dam by the USACE for flood control interrupts the downstream transport of woody debris from the upper watershed. Flood control and land-use activities by other non-Tacoma entities also affect the recruitment of woody debris to the Green River below Howard Hanson Dam. The Woody Debris Management Program (see HCM 2-08) proposed in the HCP is designed to partially restore ecosystem functions of woody debris recruitment and transport affected by non-Tacoma activities.

Tacoma is cooperating with the USACE on development of the Woody Debris Management Program, which will be implemented under the Additional Water Storage Project. Planning for the project is currently at the 35 percent design phase. More specific recommendations on the size, methods, and location of LWD placement sites are under development (e.g., Perkins 1999a), and would be provided to the Services for review as they are completed. As indicated in the HCP, while the final woody debris placement location and methodology may be refined based on more detailed analysis, there is a firm commitment to contribute to, but not to fully restore the functions of woody debris downstream of Howard Hanson Dam. Compliance monitoring conducted by Tacoma under the HCP would document whether the amount of wood placed meets the objectives specified in the HCP.

19. The Woody Debris Management Program should be modified to address the effects of the program on recreational use of the river.

Restoration of ecosystem processes is a major objective of the HCP; and while the Woody Debris Management Program may have an effect on recreation use of the river, the program is an integral part of Green River restoration efforts. Effects upon recreational boating have been identified as a concern (e.g., Perkins 1999a). Separate and apart from the HCP, the USACE and Tacoma Water would seek additional input from recreational boating interests regarding the Woody Debris Management Program as part of the Additional Water Storage Project.

The Woody Debris Management Program must be approved by the Services prior to wood transport and/or placement. Details of the woody debris management program are being developed in coordination with the Services and other resource management agencies, and potential effects of the program on recreational boating would be considered prior to transport and/or placement of wood below Howard Hanson Dam.

20. The sediment management plan needs additional detail and should be modified to restore the full function of sediment transport in the Green River.

As noted in the introductory material provided on page 5-2 of the HCP, the proposed gravel nourishment program (HCM 2-09) is a Type 2 Conservation Measure, consisting of contribution of funds and/or implementation of measures designed to offset or compensate for impacts resulting from a non-Tacoma action. In the case of gravel-nourishment, the action responsible for the majority of alteration in the sediment transport regime was construction and operation of Howard Hanson Dam, a USACE project sponsored by King County. Under the HCP, Tacoma Water proposes to provide funding to the USACE to restore a portion of the gravel necessary to maintain spawning habitat in the lower Green River. Additional gravel will be placed by the USACE and King County under the Green-Duwamish General Investigation study and through ongoing Section 7 consultation between the USACE and the Services. Coordination of the gravel nourishment program will be the responsibility of the USACE.

The primary responsibility for development of the final gravel nourishment plan and restoration of gravel transport to fully functional levels belongs to the USACE. As such, the USACE is currently developing a detailed sediment management plan, which includes planning and coordination of the gravel nourishment program. Several additional studies intended to further evaluate existing

conditions of armoring and channel degradation, to corroborate the proposed gravel placement rate, to identify specific gravel placement sites and methods, and to describe additional studies and data needed for project design have recently been completed (Perkins 1999b). The sediment management plan further proposes to refine estimates of the total amount and composition of gravel required to restore coarse sediment transport downstream of Howard Hanson Dam by sampling of delta deposits in Howard Hanson Reservoir and development of a sediment budget for the Green River upstream of RM 32. The transport capacity downstream of Howard Hanson Dam will be analyzed with a hydraulic prediction model to ensure that gravel placement does not result in excessive aggradation that could fill pools, hinder fish passage, or compromise flood control in the Middle Green River. Effectiveness monitoring will be conducted by the USACE under the Section 7 Consultation Process and Green-Duwamish General Investigation study.

21. Instream flows should be increased to provide additional recreational opportunity, and impacts to recreation should be mitigated.

The instream flow package identified in the HCP has been developed primarily with the intent of protecting fisheries resources on the Green River while still allowing the continued operation of Tacoma's water supply. Some late-spring recreational opportunities would be enhanced by the instream flows provided; however, there would be a reduction in the number of boating days in the late winter and early spring period. Changing the beginning of water storage at Howard Hanson Dam to February rather than later in the spring would provide more whitewater boating days later in the spring than are currently available. It is Tacoma's understanding that late spring boating days are preferred by most whitewater enthusiasts due to warmer air and water temperatures.

In 1995 Tacoma signed a mitigation agreement with Friends of the Green River, a group heavily involved in whitewater recreation on the Green River. This agreement covers water withdrawals of both the First Diversion Water Right claim and Second Diversion Water Right. Although this agreement did not include the Additional Water Storage Project, one objective of the Additional Water Storage Project is to store water available to Tacoma under the Second Diversion Water Right. There is no additional water diverted to storage behind Howard Hanson Dam as part of the Additional Water Storage Project than Tacoma could have diverted under the Second Diversion Water Right, which is covered by the agreement with Friends of the Green River. The Additional Water Storage Project stores water diverted under the Second Diversion Water Right during the late winter and early spring, thus reducing Tacoma's need to divert water during the more popular late spring boating season. In its present configuration, Tacoma's operation under the HCP would

1 enhance whitewater recreation opportunities as compared to previous operations covered in
2 Tacoma's mitigation agreement with Friends of the Green River.

3
4 **22. Tacoma Water should be required to ladder Howard Hanson Dam to provide upstream**
5 **passage of adult salmonids and should not be allowed to truck fish around the dam.**
6

7 Under Tacoma's proposed conservation measure (HCM 1-03), adult fish would be collected
8 downstream of the Tacoma Headworks at RM 61.0 and released at the upstream extent of the
9 Howard Hanson Dam reservoir in the vicinity of RM 72.0. The proposed upstream fish passage
10 facility includes a fish ladder over the 23.5-foot high, modified Tacoma Headworks diversion
11 combined with a trap-and-haul operation from the Headworks Dam to above the 235-foot-high
12 Howard Hanson Dam. A trap-and-haul was selected as the preferred design for the upstream fish
13 passage facility at Howard Hanson Dam because of serious concerns regarding the applicability of
14 conventional fish ladder technology to Howard Hanson Dam. The selection of a trap-and-haul
15 facility to pass adult fish over Howard Hanson Dam represents the best available solution to satisfy
16 site conditions with the greatest likelihood of success.

17
18 A fish ladder commonly consists of a series of pools in steps around the barrier, with water flowing
19 from pool to pool. The fish ascend the ladder by jumping or swimming upstream from pool to pool.
20 A trap-and-haul facility consists of a short fish ladder leading to a holding area where fish are moved
21 into a tank of water, trucked upstream above the barrier, and released into the river via a short chute.
22 Newer trap-and-haul facilities provide water-to-water transfer and no direct handling of fish. The
23 selection of a preferred type of upstream fish passage facility at a barrier considers a variety of
24 factors including: height of the barrier, probable fluctuations in water level upstream and
25 downstream of the barrier, the quantity of water available, fish stock management needs, and past
26 record of experience.

27
28 Fish ladders are generally deemed a more natural solution than trap-and-haul facilities. Fish passing
29 through fish ladders can move upstream on their own volition and require less human intervention
30 to surmount the barrier. Fish ladders are commonly used where the water level of the upstream and
31 downstream entrances can be controlled and where barriers are less than about 100 feet in height.
32 Fish ladders require the water level in the pool immediately upstream of the barrier to fluctuate less
33 than about 20 feet. Although greater ranges are theoretically possible, the greatest range of
34 fluctuation noted in a review of fish ladder technology is a fish ladder at Hell's Gate Canyon on the
35 Fraser River in British Columbia (Clay 1995). The Hell's Gate fish ladder is designed to operate

Section 3.0 General Comments and Responses

1 with up to a 45-foot fluctuation in the upstream pool. Since Howard Hanson Dam is used to
2 alternately store and release water during the flood control season, the water level behind the dam
3 can fluctuate well over 100 feet during October through December. During times when the reservoir
4 pool is low, fish that ascended a ladder over Howard Hanson Dam would need to be lowered to the
5 upstream pool level in a high velocity chute or via some type of mechanical elevator. In addition,
6 water flowing into the fish ladder would have to be continuously pumped from the low reservoir
7 pool.

8
9 As an alternative to returning fish to the low pool level through a slide or chute, the fishway could
10 be extended approximately 7 miles to the upstream end of the reservoir. This extension would be
11 in addition to the length of ladder needed to reach the crest of the 235-foot-high Howard Hanson
12 Dam. Fish ladders over 1 mile in length are uncommon because of water temperature concerns,
13 habitat conditions within the ladder, and cost. Water flowing through a fish ladder must be cold
14 enough to sustain salmonids and must exit with a water temperature similar to the water in the
15 downstream river channel. If the water flowing out of the fish ladder is much warmer than the
16 downstream river water, adult fish may be confused and unable to find, or may be unwilling to enter,
17 the fish ladder. Fish transit times through fish ladders should be less than about 6 hours according
18 to draft Washington State guidelines, which effectively limits the maximum height of a fish ladder
19 to about 90 feet (Bates, pers. comm., 24 May 2000).

20
21 Trap-and-haul facilities are generally regarded as less desirable than fish ladders when passing fish
22 over small barriers because of increased handling, stress, and non-volitional fish movement (Duke
23 Engineering & Services 1999). Trap-and-haul facilities are generally preferred where the upstream
24 reservoir pool fluctuates or where the height of the barrier exceeds 100 feet or more. Trap-and-haul
25 is often the preferred facility for management of mixed species, especially where upriver stocks are
26 to be separated from downriver stocks, or where species listed under the ESA are co-mingled with
27 hatchery stocks.

28
29 Trap-and-haul technology is successfully being employed in the Pacific Northwest at a variety of
30 sites containing high barriers or where the upstream pool level fluctuates. For example:

- 31
32 # A trap-and-haul program has been operated at the Baker River Hydroelectric Project
33 by Puget Sound Energy since 1925. In recent years, annual returns of nearly 15,000
34 adult salmon and steelhead have been passed upstream of the Upper and Lower
35 Baker dams. The Upper Baker Dam is 330 feet high and the Lower Baker Dam is

Section 3.0 General Comments and Responses

1 approximately 285 feet high.

2
3 # The WDFW has operated a trap-and-haul program at Sunset Falls on the South Fork
4 Skykomish River since the mid-1950s. The Sunset Falls trap-and-haul facility is
5 used to pass an average of 15,000 adult salmon and steelhead over three natural
6 waterfalls (28 feet, 48 feet, and 88 feet high).

7
8 # A trap-and-haul program has been operated by the USACE to pass an average of
9 approximately 6,000 adult salmon and steelhead over the 425-foot-high Mud
10 Mountain Dam on the White River since 1948. Similar to Howard Hanson Dam, the
11 Mud Mountain Dam is operated to provide flood control, and the reservoir pool
12 fluctuates during flood control season.

13
14 # The USACE has operated a trap-and-haul program on the Wynoochee River since
15 the late 1960s. The facility is used to pass an average of approximately 2,500 adult
16 salmon and steelhead over the 177-foot-high Wynoochee Dam.

17
18 Several commenters to the HCP and DEIS contested the statement that fish ladders are not generally
19 preferred to pass adult salmon over barriers over 100 feet high. They referred to the Clackamas
20 River Project in Oregon and the Cowlitz River Project in Washington as locations where fish ladders
21 were either in operation or were being considered to provide upstream fish passage at high dams.

22
23 The Clackamas River Project in Oregon consists of four separate hydroelectric developments:

24
25 # The Oak Grove Development was constructed upstream of a natural barrier and does
26 not have upstream fish passage facilities.

27
28 # The Faraday-North Fork fish ladder provides upstream fish passage around the North
29 Fork and Faraday Developments. The North Fork Development includes a 1.9-mile-
30 long fish ladder with its entrance below the Faraday Diversion Dam and rising 196
31 feet to an exit-entrance into the North Fork Reservoir above the North Fork Dam.
32 At the time of construction, the Faraday-North Fork fish ladder was the longest
33 operating fish ladder in the world. The 1.9-mile-long fish ladder at the North Fork
34 Development was designed to provide adult fish direct access to the reservoir
35 throughout an operating range of 19 feet change in water surface fluctuation.

Section 3.0 General Comments and Responses

Although the height of the Faraday-North Fork barrier is 196 feet (compared to the 235-foot Howard Hanson Dam), the magnitude of water level fluctuations in the forebay is the most significant difference between the Faraday-North Fork fish ladder and Howard Hanson Dam. The North Fork reservoir forebay fluctuates only 19 feet compared to the Howard Hanson Dam forebay fluctuation of well over 100 feet. In addition, the Faraday-North Fork ladder has not been completely successful. In response to observed delays in upstream fish passage of chinook salmon through the ladder, a trap was added near the base of the ladder, and fish are also trucked and released upstream.

The River Mill fish ladder was constructed in 1912 at the River Mill Development to provide adult fish passage over the 85-foot-high River Mill Dam directly into Estacada Lake. The concrete fish ladder steps up the face of the dam in a series of right-angle turns. The River Mill Project is operated as a run-of-river facility with typically less than 10 feet of fluctuation in the upstream reservoir level. Howard Hanson Dam is more than 2.7 times higher than the River Mill Dam, and Howard Hanson Dam forebay fluctuations are much greater than the 10-foot fluctuations experienced at the River Mill Dam. The River Mill fish ladder is considered by some to be too steep and small to facilitate upstream fish passage, and modifications are planned as part of federal relicensing of the project (Portland General Electric 1999).

A fish ladder is currently being considered to pass adult salmonids over the 182-foot-high Mayfield Dam on the Cowlitz River. High water temperatures at the upstream reservoir surface are one of several hurdles that must be overcome before a fish ladder will be attempted as an upstream fish passage facility over Mayfield Dam. One critical site difference between Mayfield Dam and Howard Hanson Dam is that the Mayfield reservoir pool level is held relatively constant. The Mayfield reservoir fluctuates less than approximately 10 feet while Howard Hanson Dam can fluctuate more than 100 feet during the fall salmon migration season.

The extreme water level fluctuation of the Howard Hanson reservoir pool, the height of Howard Hanson Dam, the desire to potentially separate out fish stocks, and water quality concerns are all factors that support the selection of a trap-and-haul as the preferred upstream fish passage facility at Howard Hanson Dam. While a fish ladder would provide volitional passage of adult salmonids, the Services believe use of a fish ladder to pass adult salmon and steelhead above Howard Hanson

Dam would be impractical given the site constraints. Use of a fish ladder at Howard Hanson Dam would involve greater risk of delayed or interrupted passage and injury to returning adult salmonids than a trap-and-haul facility.

23. Tacoma Water must be required to guarantee the restoration of naturally reproducing populations of anadromous fish above Howard Hanson Dam.

As stated earlier in General Comment Response 3, Tacoma Water is required to meet the issuance criteria under Section 10(a)(2)(B) of the ESA. Tacoma cannot be held responsible for recovery of anadromous salmon stocks in the Green River. Several factors have contributed to declines of salmonid stocks in the Green River, some of which Tacoma has influence over and some of which it does not. For example, Tacoma has addressed the interruption of fish passage at its headworks facility and is working closely with the USACE and resource agencies to address downstream passage of juvenile fish at Howard Hanson Dam. On the other hand, it has less control over the loss of riparian habitats in the middle and lower Green River and over the management of flood control structures in the Auburn Valley.

With this in mind, the restoration of anadromous fish in the Green River is of utmost concern to the Services and has been the focus of Tacoma's HCP effort. Many of the conservation measures Tacoma has committed to in the HCP are geared toward the restoration of anadromous fish both above and below Howard Hanson Dam. The Services expect these commitments by Tacoma to contribute to the recovery of anadromous stocks in the Green River, but we also recognize that the recovery of these stocks to fishable numbers is the responsibility of all users of the Green River and Green River Watershed.

24. Spawning and protective shore habitat in the Green River should be restored and preserved.

Of the 66 Habitat Conservation Measures proposed in Tacoma's HCP, 27 (41%) have been designed specifically to preserve and restore spawning and shoreline habitat in the Green River:

HCM 1-01	Minimum instream flows under the First Diversion Water Right claim
HCM 1-02	Seasonal restrictions on the Second Diversion Water Right
HCM 1-05	Tacoma Headworks large woody debris/rootwad placement
HCM 2-02	Howard Hanson Dam non-dedicated storage and flow management

Section 3.0 General Comments and Responses

1	HCM 2-03	Upper watershed stream, wetland, and reservoir shoreline rehabilitation
2	HCM 2-04	Standing timber retention
3	HCM 2-06	Low flow augmentation
4	HCM 2-07	Side channel reconnection at Signani Slough
5	HCM 2-08	Downstream woody debris management
6	HCM 2-09	Mainstem gravel nourishment
7	HCM 2-10	Headwater stream rehabilitation
8	HCM 3-01A	Upland forest management zones
9	HCM 3-01B	Natural Zone
10	HCM 3-01C	Conservation Zone
11	HCM 3-01K	Contractor and logger awareness
12	HCM 3-01M	Reforestation
13	HCM 3-01N	Harvest limitations on unstable slopes
14	HCM 3-02A	No-harvest riparian buffers
15	HCM 3-03A	Watershed Analysis
16	HCM 3-03B	Road maintenance
17	HCM 3-03C	Road construction limitations on unstable landforms
18	HCM 3-03D	Road restrictions on side slopes greater than 60 percent
19	HCM 3-03E	Erosion control
20	HCM 3-03F	Stream crossings
21	HCM 3-03H	Roadside vegetation
22	HCM 3-03I	Road abandonment
23	HCM 3-03J	Culvert improvements

24

25 Four measures (HCMs 1-01, 1-02, 2-02, 2-06) address protecting flows for salmonids while
26 balancing the municipal water supply needs of Pierce and South King Counties. Three measures
27 (HCMs 1-05, 2-08, 2-09) address the restoration of wood and gravel to the mainstem river to provide
28 structure and substrate to improve rearing and spawning habitat, and the remaining 20 measures
29 (HCMs 2-03, 2-04, 2-07, 2-10, 3-01A, 3-01B, 3-01C, 3-01K, 3-01M, 3-01N, 3-02A, 3-03A, 3-03B,
30 3-03C, 3-03D, 3-03E, 3-03F, 3-03H, 3-03I, 3-03J) address protection or restoration of shoreline and
31 riparian areas from degradation caused by human activities. The Services believe these measures
32 would contribute to the restoration and preservation of salmon habitat in the Green River.

33

34 In addition to committing to the 27 Habitat Conservation Measures listed above, Tacoma Water is
35 working with the USACE and WRIA 9 Salmon Recovery workgroups. In the WRIA 9 initiative,

1 Tacoma participates on both policy (Steering) and technical (Planning, Factors of Decline)
2 committees of the King County-sponsored planning effort. This planning effort is evolving and is
3 expected to become the focus for fish and wildlife protection, restoration, and project coordination
4 efforts.

5
6 **25. The Habitat Conservation Plan lacks quantifiable data and resource objectives.**

7
8 The Services recognize two different types of HCPs; outcome-based HCPs, and prescription or
9 conservation measure-based HCPs. With an outcome-based HCP, the Services and applicant agree
10 to a set of biological outcomes as the commitments of the permit holder. With conservation
11 measure-based HCPs, the Services and applicant negotiate specific measures, for example minimum
12 instream flow during the summer, that are designed to produce certain habitat attributes or species
13 responses.

14
15 Outcome-based management responds to ecosystem conditions and defines limits to acceptable
16 resource damage. In the outcome-based HCPs, the Services believe that quantifiable goals and
17 objectives must be clearly articulated, or we have no recourse for determining non-compliance
18 during permit implementation. This type of management is considered reactive rather than
19 preventative, since actions are modified only after degradation has occurred to levels beyond which
20 further degradation is considered unacceptable (Bauer and Ralph 1999).

21
22 In contrast, conservation measure-based HCPs, such as the Tacoma Water HCP, rely less on
23 numeric goals and objectives because the legal commitments made by the landowner are the
24 conservation measures, and not the outcomes of these measures. Conservation measure-based
25 management implies a preventative approach based on modifying management actions to reduce
26 or preclude adverse environmental impacts (Bauer and Ralph 1999). Compliance with specified
27 conservation measures thus becomes the primary focus of monitoring. The Services encourage the
28 reader to review HCM 2-02 in HCP Chapter 6 and General Comment Response 26 for more specific
29 information on the role of adaptive management in the Tacoma HCP.

26. The adaptive management provisions identified in the Habitat Conservation Plan must allow adjustments to the rate of municipal water storage and withdrawal if monitoring identifies additional impacts to fish and wildlife resources.

Adaptive management provisions do allow flow management changes within limits defined in Chapter 5 of the HCP. The flow management measures include constraints on Tacoma's existing First and Second Diversion water rights, phased implementation of additional storage, and funding support for flow augmentation to benefit instream resources. While the adaptive management provisions identified in the HCP allow increased flow adjustments to benefit fish and wildlife resources relative to baseline conditions, the limits of flow adjustment are defined to provide Tacoma Water the certainty it requires to provide municipal water to its customers.

Allowable adjustments to the rate of USACE water storage and Tacoma withdrawals are seasonal in nature. During the winter, water storage behind Howard Hanson Dam is dedicated to flood control, and there is little or no opportunity to augment flows. Restrictions on Tacoma's ability to withdraw water during the winter were developed during hearings on the Second Diversion Water Right during the early 1980s, and the 1995 MIT/TPU Settlement Agreement that constrained water withdrawals under the Second Diversion Water Right beyond state instream flow requirements.

During the spring months, the rate of water storage and release at Howard Hanson Dam will be adaptively managed to reflect annual and mid-season recommendations by the Green River Flow Management Committee (HCM 2-02). The Committee is expected to recommend adjustments to the rate of water storage and release based on results of the extensive monitoring program described in Chapter 6 of the HCP. The Committee has only two main constraints on adjusting the rate of water storage and release. Committee recommendations cannot interfere with USACE flood control responsibilities and, by the end of the spring refill period, the volume of water available to Tacoma Water under the Second Diversion Water Right must be stored and dedicated to municipal use (i.e., about 5 percent of the inflow to Howard Hanson Dam during average spring runoff conditions). The addition of the large volume downstream fish passage facility to Howard Hanson Dam provides the Flow Committee great latitude in adapting flow recommendations, and the extensive monitoring described in Chapter 6 would provide valuable feedback to the Committee on results of its flow management efforts.

Tacoma's withdrawal of water during the summer months are constrained by restrictions on the Second Diversion Water Right established in 1980 (173-509 WAC), which were affirmed by the

1 Pollution Control Hearings Board in 1981, and further constrained by a stipulated judgment in a
2 1983 Superior Court case. The 1995 MIT/TPU Settlement Agreement placed additional constraints
3 on the Second Diversion Water Right and placed constraints on Tacoma's First Diversion Water
4 Right claim. During the summer months, up to 5,000 acre-feet of water stored behind Howard
5 Hanson Dam for fisheries purposes (HCM 2-06) are available for discretionary release to benefit
6 fisheries resources. The Green River Flow Management Committee will make recommendations
7 on the timing and quantity of releases, and the results will be monitored through measures described
8 in Chapter 6 of the HCP. There are typically no USACE flood control requirements during the
9 summer months, and the Green River Flow Management Committee has latitude to store or pass
10 natural summer freshets or otherwise adjust flows based on results of the monitoring program.

11
12 The fall months may represent the greatest limitation on Tacoma's ability to balance water
13 withdrawals for municipal use with instream fisheries protection. During extreme fall drought
14 conditions, low instream flows will impact instream resources and could affect the number of adult
15 salmon returns for several years. Tacoma's guaranteed minimum flow of 225 cfs at Auburn,
16 associated with the 1995 MIT/TPU Settlement Agreement, is effective through mid-September and
17 is not effective during October drought conditions. However, under the conservation measures
18 described in Chapter 5, Tacoma would not be able to withdraw water under its Second Diversion
19 Water Right during a fall drought. During fall drought conditions, Tacoma Water anticipates using
20 water stored during spring months to meet demands for municipal water supply.

21
22 During drought conditions, Tacoma Water would convene a drought coordination meeting and seek
23 to institute consensus-derived water use restrictions (HCM 1-01). Even with restrictions on
24 Tacoma's water withdrawals, extreme low flows in the Green River would impact fish and other
25 instream resources. The 5,000 acre-feet of discretionary water may not be sufficient to avoid the
26 long-term impacts of extreme drought conditions. In recent years, Tacoma has voluntarily
27 responded to requests for additional water by curtailing withdrawals, or by using water from
28 groundwater wells to provide additional fisheries protection. Opportunities to increase the level of
29 instream resource protection while meeting municipal water supply needs would be explored
30 through the drought coordination commitments identified in HCM 1-01. The Services expect that
31 Tacoma Water would continue to voluntarily cooperate with future efforts to increase the level of
32 instream resource protection while meeting its responsibility to continue to provide safe, clean
33 municipal water. It is important to note that the Services will not consider Tacoma's voluntary
34 measures when deliberating issuance of an ITP.

27. **Instream flows should reflect natural flow variation rather than base or minimum flow requirements.**

The integrity of rivers depends largely on their natural dynamic character (Poff et al. 1997). The natural dynamic character of the Green River has been influenced by the desire to control flooding and otherwise manage the Green River for the benefit of mankind. Tacoma's withdrawal of water from the Green River for municipal use represents another man-induced impact on the natural flow variability of the river. Conservation measures identified in Tacoma Water's HCP have been designed to constrain Tacoma's withdrawal of water during extreme low flow events, and to provide the opportunity to restore a measure of natural variation to Green River flows.

In describing the ecological functions of the various components of a natural flow regime, the high and low flow events are often stressed because they may serve as ecological "bottlenecks" (Poff and Ward 1990). High flow events control the dynamic equilibrium between the movement of water and the movement of sediment in free-flowing rivers. High flow events also maintain the linkages between mainstem, side channel, and floodplain habitats. High flow events in the Green River are controlled by the USACE's mandate to reduce flooding in the lower Green River valley and will be addressed through ESA Section 7 consultation with the Services. These consultations are separate from, and outside the scope of this HCP.

Low flow events in the Green River are directly influenced by Tacoma's water withdrawals. Low flow events influence the production of salmonids that rear year-round in river systems, and were closely scrutinized during development of Tacoma's conservation measures. Tacoma's instream flow measures serve to reduce the effects of water withdrawals during the summer low flow period and guarantee that flows would not drop to historical extremes. For instance, the lowest 7-day low flow period in a 32-year record of modeled natural flows between mid-July and mid-September was 203 cfs at Auburn. Under the proposed conservation measures, flow in the Green River at Auburn between mid-July and mid-September would not drop below 225 cfs.

Tacoma's ability to alter the Green River flow regime is limited to its withdrawal of up to 213 cfs. In the absence of Tacoma's withdrawals and flow adjustments by the USACE, the average daily flow of the Green River at Auburn between 1963 and 1995 was estimated to be 1,414 cfs (CH2M Hill 1997). Assuming Tacoma withdraws a maximum 213 cfs, Tacoma's withdrawals represent about 14 percent of the average daily flow in the Green River at Auburn. During high flow conditions, Tacoma's withdrawals represent a small percentage of the Green River flow at Auburn;

1 while during low flow conditions, Tacoma's withdrawals represent a large percentage of the Green
2 River flow. Not surprisingly, several of Tacoma's conservation measures focus on resource
3 protection during low flow periods when Tacoma's withdrawals may represent a large percentage
4 of flow in the Green River. However, as previously noted, the ecological integrity of a river cannot
5 be maintained by minimum flows alone. The increased opportunity to manage a range of flow
6 releases was integral to developing a successful conservation plan and constitutes a major
7 improvement over past management of the river.

8
9 Several of the conservation measures in Tacoma's HCP provide natural resource agencies and tribes,
10 through the Green River Flow Management Committee, additional opportunity to manage flows in
11 the Green River to reflect natural flow variations. The USACE has altered the natural flow regime
12 of the Green River by reducing the magnitude of flood flows and by its past strategies of storing
13 water for low flow augmentation (see discussion of HCM 2-02 in the HCP). Although the USACE
14 has recently modified its refill strategy, the USACE's ability to manage flows during spring refill
15 while simultaneously providing safe downstream passage for outmigrating salmonids is limited by
16 the lack of a downstream fish passage facility. Tacoma's contribution to the addition of a high
17 volume downstream fish passage facility at Howard Hanson Dam (HCM 2-01) provides greater
18 opportunity to manage flows in the Green River to reflect natural flow variation. The development
19 of a program to track the volume of stored water dedicated to municipal use and the volume
20 available for managing instream flows (HCM 2-02) gives the Green River Flow Management
21 Committee a valuable tool for managing flows in the Green River. Tacoma Water's contribution
22 to up to 5,000 acre-feet of additional water available for managing instream flows (HCM 2-06) also
23 provides the Green River Flow Management Committee additional flexibility to manage flows to
24 benefit instream resources. Tacoma is funding extensive monitoring (HCP Chapter 6) that will
25 provide resource agencies and tribes, through the Green River Flow Management Committee,
26 valuable feedback to determine if its recommendations have the desired effects.

27
28 During recent years, at the request of the Green River Flow Management Committee, the USACE
29 has incorporated a *proportional capture* process for meeting water storage requirements at Howard
30 Hanson Dam. The USACE refills the reservoir by storing a percentage, or capturing a proportion,
31 of the inflow. Based on measurements of the snowpack level, predicted precipitation patterns, start
32 of refill, and desired refill completion date, the USACE stores between 10 and 15 percent of the
33 inflow. During 1999, the USACE initiated refill on 1 April and implemented a target refill rate of
34 15 percent of inflow to meet the storage target of 29,200 acre-feet. During Phase 1 of the Additional
35 Water Storage Project, up to an additional 20,000 acre-feet of water will be stored, but refill will

begin in mid-February. During an average spring, approximately 13 percent of the inflow will be needed to meet the Phase 1 Additional Water Storage target of 49,200 acre-feet.

Implementing a refill strategy that captures a proportion of the natural hydrology restores a measure of flow variability important to natural ecosystem functions. Strictly following a proportional capture regime however, may provide uncertain benefits and potential adverse impacts if applied during extreme low flow events. Many geomorphic and ecological processes show nonlinear responses to flow (Poff et al. 1997), and flow management regimes may have unintended consequences when applied to systems altered by man. Incorporating a proportional capture regime, capturing or releasing freshets, or increasing the rate of capture during high flow periods are all management options available to the Green River Flow Management Committee. The risk of unintended consequences is the primary rationale for the extensive monitoring program described in Chapter 6 of the HCP. The monitoring and adaptive management provisions provide a mechanism for adjusting flows, albeit within limits defined in Chapter 5 of the HCP.

28. Use of the ‘best available science’, a federal Endangered Species Act requirement, was not incorporated in Tacoma’s analyses of impacts in the Habitat Conservation Plan.

Any HCP must use “the best scientific and commercial data available to identify potential impacts to the endangered species and to incorporate the most effective use of research and technology to monitor, minimize, and mitigate such impacts” (50-CFR 222.22; 50 CFR 17.22 and 17.32). To assure the quality of the biological, ecological, and other information used in the implementation of the ESA (Act), it is the policy of the Services to: evaluate all scientific and other information used to ensure that it is reliable, credible, and represents the best scientific and commercial data available; gather and impartially evaluate biological, ecological, and other information disputing official positions, decisions, and actions proposed or taken by the Services; document their evaluation of comprehensive, technical information regarding the status and habitat requirements for a species throughout its range, whether it supports or does not support a position being proposed as an official agency position; use primary and original sources of information as the basis for recommendations; retain these sources referenced in the official document as part of the administrative record supporting an action; collect, evaluate, and complete all reviews of biological, ecological, and other relevant information within the schedules established by the Act, appropriate regulations, and applicable policies; and require management-level review of documents developed and drafted by Service biologists to verify and assure the quality of the science used to establish official positions, decisions, and actions taken by the Services during their implementation of the Act (59 FR 34271).

Section 3.0 General Comments and Responses

1 The scientific information used to develop the conservation measures in Tacoma Water's HCP was
2 developed from studies that were scoped, conducted, and reviewed by scientists from federal, state,
3 and tribal organizations. The Habitat Conservation Measures pertaining to instream flows were
4 developed from research conducted by Ecology and reported in its report on *Green River Fish*
5 *Habitat Analysis Using the Instream Flow Incremental Methodology* (Caldwell and Hirschey 1989).
6 This study was developed in conjunction with biologists and other participants representing the
7 NMFS, USFWS, Muckleshoot Indian Tribe, WDFW, Washington Department of Wildlife, USACE,
8 Tacoma Water, and Trout Unlimited.

9
10 A number of HCMs were constructed from information developed to assess the environmental
11 impacts of the Additional Water Storage Project. Since the inception of the Additional Water
12 Storage Project in 1989, Tacoma Water and the USACE have conducted ongoing, regular meetings
13 with all fish and wildlife resource agencies and the Muckleshoot Indian Tribe to develop and refine
14 water supply, restoration, and mitigation alternatives for the project. Throughout the entire
15 reconnaissance and feasibility processes, these representatives interacted directly with Tacoma
16 Water and the USACE in shaping the scale, components, and details of each of the Additional Water
17 Storage Project features.

18
19 Habitat Conservation Measures pertaining to downstream fish passage were developed from a large
20 body of research on fish passage conducted in the Pacific Northwest, including several studies
21 conducted by the WDFW and the USFWS on the success of salmon and steelhead juvenile passage
22 through Howard Hanson Dam and Reservoir. In 1989, a Fish Passage Technical Committee was
23 convened by Tacoma Water and the USACE to provide a report on juvenile fish passage facility
24 options for Howard Hanson Dam that could be considered in greater detail by the USACE during
25 the feasibility study for the Additional Water Storage Project. The Committee consisted of five
26 experts nominated by federal and state fisheries agencies, the Muckleshoot Indian Tribe, and
27 Tacoma. The Committee published its report in January 1990. In 1992 the Committee was
28 reactivated to assist in developing, evaluating, and selecting a feasibility level fish passage concept
29 for the proposed project. In 1996 the Committee provided final input in evaluating and selecting
30 among the final fish passage alternatives.

31
32 The Fish Passage Technical Committee report also provided a framework for developing baseline
33 studies to assess the existing state of downstream fish passage at Howard Hanson Dam. A series of
34 baseline interagency monitoring studies were subsequently initiated in 1990 by the USFWS,
35 WDFW, the Muckleshoot Indian Tribe, USACE, and Tacoma Water, and are scheduled to continue
36 through the year 2000.

Section 3.0 General Comments and Responses

1 In addition to fish passage studies, Tacoma and the USACE also funded the USFWS to study other
2 potential Additional Water Storage Project impacts to fish. In 1992 the USFWS reported its findings
3 on the potential effects of inundating tributary habitat by the increased pool. In 1993 the USFWS
4 published a report on the vertical distribution of juvenile salmonids in the forebay behind Howard
5 Hanson Dam. Results of this study have been used in development of the downstream passage
6 facility at Howard Hanson Dam. In 1994 the USFWS published a report on the horizontal and
7 vertical distribution of juvenile salmonids in the reservoir, and in 1996, the USFWS published its
8 findings on the travel time of coho salmon and steelhead smolts emigrating through the reservoir.
9 Between 1996 and 1999 the USFWS published three progress reports on the rate of returning adult
10 coho and chinook tagged and released above and below the Howard Hanson Dam in 1994 through
11 1997. The last of the adult fish tagged as part of this study are expected to return in the fall of 2000.

12
13 Initial scoping for the Environmental Impact Statement for the Additional Water Storage Project was
14 conducted in 1991 (Federal Register Notice of Intent published January 25, 1991) but was
15 essentially suspended while the above referenced studies were conducted. Scoping was reinitiated
16 in 1996 with a second Notice of Intent to prepare an Environmental Impact Statement published in
17 the Federal Register on July 9, 1996. Public comment was sought in accordance with regulatory
18 procedures, and a public scoping meeting was held in Auburn on July 18, 1996.

19
20 As a result of the comments received in the scoping process, additional studies were undertaken. A
21 study of the juvenile use of lateral stream habitats in the middle Green River was initiated in
22 February 1998 based on physical data collected by Coccoli (1996) and Madsen and Hilgert (1997).
23 The study was conducted during the fall of 1996 and the spring of 1998, 1999, and 2000. In the
24 spring of 2000, a screw trap was installed and operated by WDFW in the middle Green River to
25 document the existing characteristics of outmigrating juvenile salmonids. The study is expected to
26 continue for several years to gather information on seasonal and diel movement, response to
27 environmental changes (flow, turbidity, day length, temperature), and observed responses during
28 Howard Hanson Dam refill and release.

29
30 Upland Forest Management conservation measures were developed from DNR Watershed Analyses
31 conducted in the Lester, Upper Green Headwaters/Sunday Creek, and Howard Hanson/Smay Creek
32 Watershed Analysis Units; the U.S. Forest Service's Northwest Forest Plan; the Forests and Fish
33 Report; the DNR Forest Practices Rules; other approved HCPs in the watershed; and a Forest
34 Inventory/GIS of Tacoma Water lands. Species-specific management measures were developed
35 from recommendations made by the USFWS and WDFW based upon their own and others' research
36 and experience in working with these species.

1 The Services have carefully considered all the factors noted above and believe that the information
2 presented in the HCP does represent the best scientific and commercial data available. In addition,
3 information contained within several of the public comments supplements the existing record and
4 will also be considered by the Services during their ESA determinations. Based on the current
5 record, the Services do not believe there are areas of great scientific uncertainty that would require
6 an independent scientific review of the proposed conservation measures beyond what has been
7 received during scoping and public review. This assessment by the Services will continue to be
8 reviewed as the Biological Opinions and § 10(a)(2)(B) Findings are prepared.

9
10 **29. The direct and indirect effects of Tacoma Water's proposed water withdrawals on**
11 **future urban growth must be clearly analyzed in the Environmental Impact Statement.**
12

13 The Services interpret that the various commenters' underlying concerns relate to the impact of
14 urban growth on the human environment. While urban growth will occur, an analysis of the impact
15 of urban growth is outside the scope of this DEIS and has been more appropriately addressed
16 through other regional and statewide planning efforts.

17
18 As stated in subsection 1.6.5 of the DEIS, the distribution of growth in the state of Washington is
19 managed under the Growth Management Act (GMA). The development of Growth Management
20 Plans are required for many counties and allowed for in other counties under the Revised Code of
21 Washington, Chapter 36.70.

22
23 Under the GMA, growth is projected by the state's Office of Fiscal Management and is allocated
24 to the counties. The counties use these allocations to develop their Growth Management Plans and
25 to address projected population increase and associated needs for services. Both counties and cities
26 may plan under the Growth Management Act. Plans developed under the GMA guide zoning and
27 development permits within the jurisdictional boundaries of the plans. In the state of Washington,
28 therefore, distribution of water does not induce or lead to growth, but rather responds to the growth
29 needs previously identified through a statewide process and specifically allocated by local
30 government planning under the GMA.

31
32 In the case of Tacoma Water's service area, GMA Plans have been developed by Pierce County, the
33 City of Tacoma, King County, the City of Seattle, and a number of other cities in King County.
34 These plans forecast and direct urban growth within Tacoma Water's service area. The service of
35 water from the Green River by Tacoma, therefore, appropriately responds to the growth-related

1 service requirements identified by the GMA. Furthermore, local, county, and state ordinances,
2 including those regulating future growth, are currently being reviewed and updated to ensure they
3 comply with Section 4(d) take prohibitions or meet the standards required for exemption under the
4 Section 4(d) limit published in July 2000.

5
6 **30. The cumulative impacts analyses in the Environmental Impact Statement should**
7 **include related projects such as the Green River Second Supply Project and the**
8 **Additional Water Storage Project.**
9

10 The cumulative effects analysis in the DEIS has been expanded to include a more comprehensive
11 discussion of other federal, state, and local/private programs, processes, and projects that have the
12 potential to interact with the proposed action to affect listed species in a cumulative manner.
13

14 Two such projects include the USACE's Additional Water Storage Project, and the Green River
15 Second Supply Project. These are separate and distinct from the Tacoma Water proposed HCP, but
16 both are related. The Additional Water Storage Project is separate and distinct because it could take
17 place regardless of whether Tacoma Water obtains an ITP. The Additional Water Storage Project
18 is related in that it is intended to provide additional capacity to store flood water behind the
19 USACE's Howard Hanson Dam. Since the additional flood water storage capacity will not be
20 needed in the summer, this additional storage capacity will make it possible for Tacoma to make use
21 of additional water from the Green River during that time. The potential impacts of the additional
22 storage and the resulting need for mitigation will be addressed in an ESA consultation between the
23 Services and the USACE. The impacts of the additional water withdrawal are already addressed in
24 subsection 4.2, Water Withdrawal Alternatives, of this EIS.
25

26 The Second Supply Project is separate and distinct because it could be constructed and operated
27 regardless of whether or not Tacoma Water obtains an ITP for its operations in the Upper Green
28 River Watershed. The Second Supply Project is related in that it involves the construction and
29 operation of an additional water supply pipeline originating at Tacoma's Headworks. The potential
30 impacts of the construction and operation of the new pipeline and the resulting need for mitigation
31 will be addressed through a separate State Environmental Policy Act EIS. The impacts of the
32 additional water withdrawal are already addressed in subsection 4.2, Water Withdrawal Alternatives,
33 of this EIS.
34
35

1 **31. The comment period for the DEIS/HCP should have been extended.**

2
3 The Services did extend the comment period in direct response to public requests. The original
4 comment period was 60 days. The extension added 17 days, resulting in a 77-day comment period.
5 The Services believe this falls within the following direction from the Services' 5-Point Policy for
6 HCPs, "The public review period for large, complex HCPs is 90 days, unless there is significant
7 public involvement during development. All other HCPs (including large complex HCPs with
8 significant public involvement) will be made available for review and comment for a minimum of
9 60 days" (65 FR 35241).

10
11 Extensive public involvement occurred throughout the development of this proposed action. The
12 public involvement included: substantial outreach by Tacoma Water, which involved numerous
13 meetings with tribes, state agencies, and special interest groups, and distribution of a newsletter to
14 interested parties; a 30-day scoping period during which written comments were solicited from
15 interested parties, and one scoping meeting was held; a 77-day comment period for the draft
16 documents during which written comments were solicited from interested parties, and three public
17 meetings were held; and the final 30-day review period following issuance of final documents. The
18 30-day scoping period, 77-day comment period, and 30-day review period were each announced in
19 Federal Register notices, "interested party" letters, and press releases.